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Senniger Powers Leavitt & Roedel
16th Floor
One Metropolitan Square
St Louis, MO 63102

EXAMINER	
CHORBAJI, MONZER R	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/831,585
Filing Date: July 27, 2001
Appellant(s): BIERMAIER, HANS

Michael G. Munsell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on 08/30/2006 appealing from the Office action mailed on 12/30/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,059,965	Laing et al.	5-2000
6,402,897	Gunn	6-2002
5,251,689	Hakim-Elahi	10-1993
5,687,678	Suchomel et al.	11-1997

Laing et al. discloses thermal sterilizer that includes the following: a counterflow heat exchanger with a conduit having a heating section in fluid connection with a cooling section, a heating source, the heating section and the cooling section being spirally arranged around the heating source and the conduit being constructed of flexible material.

Gunn teaches that in the art of water treatment, the following are known: designing spiral heat exchangers, using check valves, heat exchangers are built from thin sheets, placing check valve on the heating section, placing the check valve at the inlet end of the heating section and employing thin sheets of metal into designing heat exchangers.

Hakim-Elahi teaches that in the art of designing heat exchangers the use of elastic materials is known.

Suchomel et al. teaches that in the art of heating water by using spiral heat exchanger, it is known that individual conduits be arranged coaxially one inside the other and that it is also known that individual windings lie in the same plane.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 22 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Laing et al (U.S.P.N. 6,059,965).

With respect to claim 22, the Laing reference discloses thermal sterilizer that includes the following: a counterflow heat exchanger (col.1, lines 54-55) with a conduit (figure 1:15) having a heating section (figure 1:13) in fluid connection with a cooling section (figure 1:14), a heating source (figure 1:11), the heating section and the cooling section being spirally arranged around the heating source (figure 1:11, 13 and 14) and the conduit being constructed of flexible material (col.1, lines 58-59).

With respect to claim 30, the Laing reference teaches that the conduit is made of a plastic material (col.1, lines 58-59).

Claims 11, 13-14, 20-21, 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897).

With respect to claim 11, the Laing reference discloses thermal sterilizer that includes the following: a counterflow heat exchanger (col.1, lines 54-55) with a conduit (figure 1:15) having a heating section (figure 1:13) in fluid connection with a cooling section (figure 1:14), a heating source (figure 1:11), the heating section and the cooling section being spirally arranged around the heating source (figure 1:11, 13 and 14), the heating source being generally located in the center of the spiral (figure 1:11), the conduit being constructed of flexible material (col.1, lines 58-59) and the individual windings of conduit lying one on the other and contacting each other (figure 1:14 and

13). The Laing reference fails to teach including a check valve in the device; however, the Gunn reference, which is in the art of water treatment, teaches that designing spiral heat exchangers (122) and using check valves (29) for allowing water to flow from the heating section (5) to the cooling section (13) are conventional. As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of the Laing reference by including a check valve as taught by the Gunn reference in order to control the flow out of the heating section and to also prevent backflow of the heated water (col.6, lines 40-43).

With respect to claims 13-14 and 23, the Laing reference fails to teach placing check valve on the heating section and the check valve is placed at the inlet end of the heating section; however, the Gunn reference teaches placing check valve (figure 1:29) on the heating section and the check valve is placed at the inlet end of the heating section (figure 2:112 and col.9, lines 16-19). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of the Laing reference by including a check valve as taught by the Gunn reference in order to control the flow out of the heating section and to also prevent backflow of the heated water (col.6, lines 40-43).

With respect to claims 20 and 29, the Laing reference fails to explicitly teach constructing the conduits of the heat exchanger by using metallic material, however, the Gunn reference teaches that heat exchangers are built from thin sheets of metal (figure 7:242 and col.15, lines 35-38). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heat exchanger

of the Laing reference by building it with thin sheets of metal as taught by the Gunn reference since thin metallic sheets easily allow heat to transfer within them (col.15, lines 50-53).

With respect to claim 21, the Laing reference teaches that the conduit is made of a plastic material (col.1, lines 58-59).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) as applied to claim 22 and further in view of Hakim-Elahi (U.S.P.N. 5,251,689).

With respect to claim 24, the Laing reference fails to teach the concept of using elastic materials in building heat exchangers; however, the Hakim-Elahi reference teaches the use of elastic materials in the art of designing heat exchangers (col.1, lines 60-68). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heat exchanger of the Laing reference by including elastic material as taught by the Hakim-Elahi reference in order to design a flexible heat exchanger (abstract, lines 5-6) that can be easily coiled.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) as applied to claim 22 and further in view of Suchomel et al (U.S.P.N. 5,687,678).

With respect to claims 26-28, the Laing reference fails to teach the following: two individual conduits arranged coaxially one inside the other, individual windings lie in the same plane and individual windings arranged in a spherical form. The Suchomel reference, which is in the art of heating water by using spiral heat exchanger, teaches

individual conduits arranged coaxially one inside the other (figure 3, 22, inner and outer tubings) and individual windings lie in the same plane (figure 3, two bottom tubings, 22, lie in the same plane). Further, the individual windings of the Suchomel reference are arranged in a cylindrical shape (figure 3, 22); however, choosing the shape of the heat exchanger coils is a matter of design choice that is within the scope of the artisan. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify shape of the spiral conduits of the heat exchanger of the Laing reference to cylindrical shape since such a substitution is a matter of design choice as evidenced by the Suchomel reference.

Claims 15-16 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897) as applied to claim 11 and further in view of Hakim-Elahi (U.S.P.N. 5,251,689).

With respect to claims 15-16 and 25, both the Laing reference and the Gunn reference fail to teach the concept of using elastic materials in building heat exchangers; however, the Hakim-Elahi reference teaches the use of elastic materials in the art of designing heat exchangers (col.1, lines 60-68). As a result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heat exchanger of the Laing reference by including elastic material as taught by the Hakim-Elahi reference in order to design a flexible heat exchanger (abstract, lines 5-6) that can be easily coiled.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897) as applied to claim 11 and further in view of Suchomel et al (U.S.P.N. 5,687,678).

With respect to claims 17-19, both the Laing reference and the Gunn reference fail to teach the following: two individual conduits arranged one inside the other, individual windings lie in the same plane and individual windings arranged in a spherical form. The Suchomel reference, which is in the art of heating water by using spiral heat exchanger, teaches individual conduits arranged one inside the other (figure 3, 22, inner and outer tubings) and individual windings lie in the same plane (figure 3, two bottom tubings, 22, lie in the same plane). Further, the individual windings of the Suchomel reference are arranged in a cylindrical shape (figure 3, 22); however, choosing the shape of the heat exchanger coils is a matter of design choice that is within the scope of the artisan. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify shape of the spiral conduits of the heat exchanger of the Laing reference to cylindrical shape since such a substitution is a matter of design choice as evidenced by the Suchomel reference.

(10) Response to Argument

Claims 22 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Laing et al (U.S.P.N. 6,059,965).

A.1 On pages 6-9 of the brief, Appellant argues that Laing fails to teach a conduit constructed of flexible material since the heat transferring walls of Laing are held in place by being inserted into slots/grooves thus the walls must be rigid in order to remain

in place, that the heat transferring walls of Laing are made from a rigid plastic and not a flexible plastic material, that the walls of Laing must be rigid for the water to be pumped between them, otherwise, such walls would bow inwardly and their edges would disengage from the grooves/slots in the endplates and the outer wall and that flexibility of the conduit would produce a peristaltic motion that additionally generates pulsing water flow through the heat exchanger.

As to Appellant's arguments regarding that walls of Laing are not flexible but rigid, the instant disclosure does not provide parameters that define what constitute flexibility or what degree constitute "a flexible material". For example, no value for the modulus of elasticity is provided in the disclosure. The plastic material used in Laing is considered to be flexible material in that plastics are flexible compared to many other materials and the conduits are thin tubes formed in a spiral configuration, which would require flexibility in order to be formed. On page 3, numbered lines 7-11, of the specification; plastic or metal is considered by Applicant to represent flexible material. With regard to Appellant's arguments with respect to Laing's walls being held in grooves/slots in the endplates for the water to be pumped between them, it shows that the walls of Laing conduits are indeed flexible because they require means to hold them in place while fluid is pumped through through the device. Note that claim 22 only requires conduits made from flexible material. Also, note that the instant claims do not recite the "peristaltic pump" feature.

A.2 On page 10 of the Brief, Appellant argues that, "It is entirely possible that the heat transferring walls of Laing are made from plastic but not a plastic film as recited in claim 22."

Page 9 of the specification and figures 2a-2b, or 3a-3b, or 4a-4b defines and show that a film is a thin layer of plastic or metal. Clearly, the plastic strips (figure 1:15) of Laing meet Applicant's definition of plastic film.

Claims 11, 13-14, 20-21, 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897).

B.1 On pages 10-12 of the Brief, Appellant argues that both Laing and Gunn do not teach that their heat transferring walls are made from flexible materials.

As mentioned above in subsection **A.1**, Laing does teach that the conduits are made of flexible material (i.e., plastic). Gunn is combined not for the use of flexible material but for the following features: designing spiral heat exchangers, using check valves, placing check valve on the heating section and placing the check valve at the inlet end of the heating section.

B.2 On page 12 of the Brief, Appellant argues that the thin metallic sheets of Gunn appear to be rigid and are not analogous to the metal film recited in claim 20.

The disclosure and the drawings of the instant applicant do not provide features with regard to the thickness of the metallic sheet nor provide any parameters that define what constitute flexibility or what degree constitute "a flexible material". For example, no value for the modulus of elasticity is provided in the disclosure. On page 3, numbered

lines 7-11, of the specification; plastic or metal is considered by Applicant to represent flexible material. In addition, Page 9 of the specification and figures 2a-2b, or 3a-3b, or 4a-4b defines and show that a film is a thin layer of plastic or metal. Therefore, the metallic films (figure 7:242 and col.15, lines 35-38) of Gunn meet Applicant's definition of metal film.

B.3 On page 13 of the Brief, Appellant argues that Laing does not disclose conduits made from plastic film.

As mentioned above in subsection **A.1**, Laing does teach that the conduits are made of flexible material (i.e., plastic). Furthermore, the specification on page 9 and figures 2a-2b, or 3a-3b, or 4a-4b defines and show that a film is a thin layer of plastic or metal. Clearly, the plastic strips (figure 1:15) of Laing meet Applicant's definition of plastic film.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) as applied to claim 22 and further in view of Hakim-Elahi (U.S.P.N. 5,251,689).

C.1 On pages 13-14 of the Brief, Appellant argues that the examiner has failed to provide a convincing line of reasoning as to why one of ordinary skill in the art would combine Hakim-Elahi with Laing since the walls of Laing's conduits need to be rigid and doing so would render Laing device inoperable.

The examiner refers Appellant to subsection **A.1** regarding the issue of flexibility. With respect to Appellant comment regarding the lack of providing a convincing line of reasoning, the examiner has provided an advantage taught by Hakim-Elahi (see page 5

of action dated 12/30/2006) and the rejection above as to why one of ordinary skill in the art would utilize Hakim-Elahi teachings into Laing. It is known in the art to form conduits in heat exchangers out of a variety of materials. Laing only appears to disclose that the conduits are formed from plastic. Hakim-Elahi shows it is known in the art to form conduits in heat exchangers from elastic materials in order to form flexible conduits. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the conduits in Laing from well known commercially available materials such as elastics as shown by Hakim-Elahi in order to produce flexible conduits. Only the expected results would be attained.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) as applied to claim 22 and further in view of Suchomel et al (U.S.P.N. 5,687,678).

D.1 On page 14 of the Brief, Appellant argues that, "The assertion that it is well within the ordinary skill of the art or an obvious matter of design choice is insufficient to make out a prima facie case of obviousness."

Suchomel discloses it is known to form heat exchangers where the conduits are coaxial. It is generally known in the heat exchanger art to provide conduits in a coaxial formation for a variety of reasons including to form a more compact exchanger and for better heat exchange between the two conduits. Providing the apparatus in Laing with the conduits in coaxial formation is a design choice well within the purview of one of ordinary skill in the art. Only the expected results would be attained.

Claims 15-16 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897) as applied to claim 11 and further in view of Hakim-Elahi (U.S.P.N. 5,251,689).

E.1 On page 15 of the Brief, Appellant argues that there is no motivation in any of the cited references to replace the heat transferring walls of Laing with the elastic material of Hakim-Elahi since doing so would render Laing's device inoperable for its intended purpose.

The examiner refers the Appellant to subsection **C.1**.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing et al (U.S.P.N. 6,059,965) in view of Gunn (U.S.P.N. 6,402,897) as applied to claim 11 and further in view of Suchomel et al (U.S.P.N. 5,687,678).

F. On page 15 of the Brief, Appellant argues that, "As mentioned before, the assertion that it is well within the ordinary skill in the art or an obvious matter of design choice is insufficient to make out a prima facie case of obviousness."

The examiner refers the Appellant to subsection **D.1**.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

GLADYS JP CORCORAN
SUPERVISORY PATENT EXAMINER

Monzer R. Chorbaji MRC

Conferees:

Gladys Corcoran GRC

JENNIFER MICHENER
QUALITY ASSURANCE SPECIALIST

Michael G. Munsell
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102